

chief usefulness as a book of reference; and in this connection it is to be regretted that the index is not so complete as it might be. The reviewer can find, for instance, no mention of oxygen or St. Moritz in the index. The latter omission is perhaps excusable in that Davos is indexed, but the former should certainly not have been omitted. The treatment of cyanosis by oxygen is, however, mentioned in the text under acute pneumonia, and though discussed somewhat insufficiently, forms a paragraph heading. To continue with the article on pneumonia, the author draws attention to the value of bleeding in this disease, and clearly points out its indications.

In the opinion of the reviewer, one of the best written chapters in the book is the one on respiratory neuroses, including under this term asthma, whooping cough and Cheyne-Stoke's breathing, the section devoted to the latter condition being of especial interest, and containing the clinical notes of a case which presented this phenomenon continuously for eight weeks.

Under the subject of broncho-pneumonia, the author adopts an original classification for the disease, which he illustrates by cases. He brings forward evidence to show that this classification has a bacteriological justification. Some 200 pages are devoted to phthisis, and of these approximately thirty are concerned with the treatment of the disease. The subject is not treated in a specially exhaustive manner, and certain statements of the author will not meet with general acceptance. That fever rarely requires treatment in phthisis is a statement that requires modification; also it is somewhat odd that in the treatment detailed for fever by the author, no mention is made of rest in bed, although in a very short account of the open-air treatment of phthisis, obtained apparently second hand, it is distinctly stated that the patients are not permitted to take exercise if the morning temperature be above normal.

The book contains a mass of clinical fact, and the author has spared neither words nor illustrations in recording what must be regarded essentially as the result of his own clinical experiences. Judged from this standpoint, the work is interesting and valuable. As is clearly pointed out in the preface, the task was no easy one; the greater, however, will be the satisfaction of having succeeded in accomplishing it.

THE GEOLOGY OF THE ISLE OF MAN.

Memoirs of the Geological Survey, United Kingdom: The Geology of the Isle of Man. By G. W. Lamplugh, F.G.S., with Petrological Notes by Prof. W. W. Watts, M.A., F.G.S. Pp. xvi + 620. (His Majesty's Stationery Office.) Price 12s. net.

NOT only will this memoir, which embodies the results of a recent survey of the Isle of Man by the author, be appreciated by those who are interested in the stratigraphy of the island, but the volume will be equally welcomed by geologists generally for the valuable additions which it makes to our knowledge of dynamical and glacial geology.

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The term "Skiddaw Slates," formerly applied to the rocks which form the hilly massif of Manxland, is now wisely abandoned in favour of "Manx Slate Series." Neither top nor bottom of this group is exposed, nor is its age certainly known, though Cambrian is suggested. The general structure is held to be most probably of the nature of a *synclinorium* (Dana) or *inverted fan-structure* (Heim) in opposition to the older view that it was an anticline, but the stratigraphical difficulties have not allowed this important point to be definitely established. Worm-tracks are not uncommon in some of the beds, but the author thinks that the so-called trilobite and graptolites obtained from the series are more likely to be imitative inorganic structures than true fossils.

When we read that the pebbly-looking tracts in the slates are pseudo-conglomerates, that igneous dykes simulate and have been regarded as interbedded greywackes, that truly interbedded grits have acquired an intrusive aspect and seem in some way to be connected with the metamorphism of the adjacent slates, and that earth-movements can also manufacture ripple-marks, oblique lamination, and "graptolites," it is evident that the stratigraphy has presented special difficulties, and that the surveyor has had to exercise extreme caution to avoid committing serious mistakes.

The effects of earth-movements on the Manx Slates are most interestingly described, though the principal evidence and conclusions are already familiar from Messrs. Lamplugh and Watts's paper on "The Crush-conglomerates of the Isle of Man," published in 1895. Some additional details are, however, now given. A more suitable term than "crush-conglomerate" is needed. It is liable to be confused with "crushed conglomerate," and is not sufficiently expressive of the fact that the rocks described were never true conglomerates. Another term, "autoclastic," introduced by American writers and frequently used in this memoir, might with advantage be changed to "authiclastic" (=brecciated *in situ*).

In the chapter on the Carboniferous Rocks of the Castletown area, the remarkable structures exhibited in the volcanic and associated beds, as originally described by Mr. Lamplugh in 1900, engage most attention. The details are very carefully and clearly set forth, and the conclusions, though at first startling, appear to be warranted by the evidence. The author claims that, owing to the thrusting of the Carboniferous Rocks towards the central massif of the island, interbedded lavas were broken up into blocks and displaced, and that fragments of them and of the underlying limestone were torn off and involved in the adjacent volcanic ash, thus forming an agglomerate-looking rock which is practically an uncrushed "crush-conglomerate." He suspends judgment as to the origin of the limestone "knolls" of the locality.

The author takes the view that the Peel Sandstones are of Lower Carboniferous age, whereas Prof. Boyd Dawkins asserts that they belong to Permian time. The age of these rocks is admitted to be a difficult question, but the two writers are at conflict as to facts which ought not to be in dispute. Thus, Dawkins states

that certain red rocks passed through in a boring at Knock-e-Dooney "are identical physically with those which are exposed on the shore to the north-east of Peel," while Lamplugh remarks of the same strata that "they bear no resemblance . . . to the Peel rocks."

As would be expected from his previous glacial work the author has devoted particular attention to the glacial drifts and other superficial deposits of the isle, and in this portion of the book the writer is seen at his best. His principal conclusions are confirmatory of those of Kendall, whose work is fully acknowledged, as, indeed, is the work of all previous writers on Manx geology. He rejects the "submergence" hypothesis, and traces the sequence of events from the gradual formation of the ice-sheet through its various phases to its final disappearance. The thickness of the ice on the bed of the Irish Sea is estimated at not less than 3000 feet. The phenomena that occurred during the melting of the ice have been ably worked out, especially in the north of the island, where the formation of glacial lakes with their overflows is clearly and convincingly described.

The full details given of the metalliferous deposits should be valuable in connection with mining enterprises. The account of the igneous rocks is fairly exhaustive, the petrological descriptions being in the form of notes mainly from the pen of Prof. Watts. Considering the space devoted to the descriptions, it is a pity that the microscopic characters, especially the structures of the rocks, are not illustrated by a plate or a few text-figures.

The volume bears evidence throughout of the author's stratigraphical skill. His facts are well arranged and clearly stated, and his conclusions carry confidence to the reader's mind because there is no appearance of any attempt to make the evidence prove more than the facts will reasonably explain. C. A. M.

MEMOIRS OF PHYSICS.

Rapports présentés au Congrès international de Physique réuni à Paris en 1900. Edited by Ch. Ed. Guillaume and L. Poincaré. 4 vols. (Paris: Gauthier-Villars, 1900.)

WHEN the Société Française de Physique organised its international congress on physics, at the Paris Exhibition in 1900, it was the wish of several members of the commission appointed for that purpose, notably of their distinguished president, M. A. Cornu, whose death we have since had occasion to deplore, that a volume should be prepared which might survive the reunion which gave it origin, and form a suitable record of the same. This happy thought led to the request that a number of investigators should give accounts of their life works, showing the connections with the results obtained by previous investigations, and indicating probable advances in the future. These investigators were asked to forget, for the moment, the multitude of interesting details involved in their researches, and to treat their re-

spective subjects from a general point of view. As a consequence, we have before us a series of memoirs on important branches of physics, each written by a recognised authority, dealing with important and far-reaching advances in physical science. The value of these memoirs is greatly enhanced by full references to original publications.

In the first volume, amongst other important papers, we may notice a paper on the precision of length determinations, by J. René Benoît. This paper contains an account of Prof. Michelson's standardisation of the metre, in terms of the wave-length of light. An interesting paper by P. Chappuis deals with practical and theoretical scales of temperature, while J. S. Ames contributes an article on the mechanical equivalent of heat, and E. H. Griffiths adds an appendix on the specific heat of water.

To the general reader, vol. ii. will perhaps be found of greatest interest. This volume deals with recent advances in optics, electricity, and magnetism; W. Wien contributes an article on the theoretical laws of radiation, which is followed by a paper on the radiation of a black body, by O. Lummer, and another on the emission of light by gases, by E. Pringsheim. These three papers form an excellent introduction to the recent extensions of thermodynamical methods to the theory of radiation. Prof. Lebedew gives an account of his experimental proof of the mechanical pressure of light, while H. Rubens describes his investigations of infra-red waves of great length. A paper by J. R. Rydberg gives a brief account of the distribution of lines in the spectra of the elements. This is a subject which will probably be greatly extended in the future; it may very probably lead to a complete mechanical theory of atomic structure, a domain into which the researches of Lorentz and Zeeman have already given us a glimpse. M. Cornu's paper on the velocity of light will be read with great interest, although it would hardly appear that the author made out a very strong case against the researches of Michelson and Newcomb. A paper on the electromagnetic theory, by J. H. Poynting, should be in the hands of all advanced students of physics. These, together with the remaining articles in vol. ii., render this of unusual interest.

Vol. iii. contains papers on recently discovered magneto-optic phenomena, by H. A. Lorentz; the theory of dispersion and metallic reflection, by P. Drude; and on radio-active substances, by H. Becquerel and by M. and Madame Curie. Prof. J. J. Thomson considers the results of recent researches on the passage of electricity through gases; V. von Lang examines the evidence as to the back E.M.F. of the electric arc, while A. Potier contributes a very readable article on poly-phase currents. C. V. Boys gives an account of the various methods of determining the Newtonian constant of gravitation, with an able criticism of the various values obtained.

The fourth volume contains the minutes of the congress, a number of replies to criticisms and short communications, and, finally, a list of names of the members. E. E.